



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/555,926	09/01/2006	Lue Brohan	032013-132	4704

7590 01/27/2010
E. JOSEPH GESS, ESQ
BURNS, DOANE, SWECKER & MATHIS, LLP
P.O. BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

NGUYEN, NGOC YEN M

ART UNIT	PAPER NUMBER
----------	--------------

1793

MAIL DATE	DELIVERY MODE
-----------	---------------

01/27/2010

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/555,926	Applicant(s) BROHAN ET AL.	
	Examiner Ngoc-Yen M. Nguyen	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 10-18 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☒ Claim(s) 6 and 7 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's election with traverse of Group I in the reply filed on November 6, 2009 is acknowledged. The traversal is on the ground(s) that the common technical feature between the groups is the crystals of aquo-oxo chloride as defined in claims 8-10. This is not found persuasive because in Groups I, III, IV and V, the aquo-oxo chloride is not required to be "crystals", thus, the common technical feature between the groups is just the compound of aquo-oxo chloride itself and this is known in the art as evidenced by Reichmann reference..

The requirement is still deemed proper and is therefore made FINAL.

Claims 8-18 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on November 6, 2009.

Claims 6-7 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or suggest a process for producing titanium aquo-oxo chloride using an alkali metal carbonate.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reichmann et al ("Raman Study of the Preparation of SiO₂-supported TiO₂ from TiCl₄ and HCl", Langmuir 1987, Vol. 3, pp. 111-116) with Jones et al (5,024,827) to show inherent state of fact, and optionally further in view of Jun-Jae Kim et al ("Homogeneous Precipitation of TiO₂ Ultrafine Powders from Aqueous TiOCl₂ Solution", J. Am. Ceramic Society, Vol. 82, No. 4, pp. 927-32 (1999)).

In the instant claims, "titanium aquo-oxo chloride" is considered to be a "Ti₈O₁₂" as defined on page 3, lines 21-26 and in turn "Ti₈O₁₂" is defined as "Ti₈O₁₂(H₂O)₂₄Cl₈ · HCl · 7 H₂O" on page 4, lines 22-27.

Reichmann et al disclose a process comprising preparing a titanium solution by diluting 99.9% TiCl₄ with hydrochloric acid and water and using silica a support. Silica-supported TiO₂ samples were prepared by incipient wetness impregnation of SiO₂ with a solution 0.4-3.3 M in TiCl₄ and 6.0 M in HCl. Following impregnation, the water was evaporated and the solid was dried and then calcined in air (note "Experimentation Section" on page 112, last paragraph in left column and first paragraph in right column). Reichmann et al discloses that the influence of HCl concentration on the Raman spectra is shown in Figure 2, which shows a bulk titanium aquo-oxo chloride (note a) in Figure

Art Unit: 1793

2). Reichmann et al teach that with increasing TiCl_4 and HCl concentrations in the impregnating solution, the titanium proceeds from monomeric species to dimers and finally oligomers, one of which is cubic complex $\text{Ti}_8\text{O}_{12}(\text{H}_2\text{O})_{24}\text{Cl}_8 \cdot \text{HCl} \cdot 7 \text{H}_2\text{O}$ (note abstract).

Jones '827 is applied to show that when a titanium halide, e.g. titanium tetrachloride in water acidified with hydrochloric acid, is hydrolyzed, i.e. in the presence of water, just as in the process of Reichmann, a solution of TiOCl_2 is inherently formed (note column 1, last 3 lines).

For the limitation "an atmosphere with moisture maintained between 50 and 60%", the water in the process of Reichmann is considered as "an atmosphere" contains moisture (when "an atmosphere" is considered the same as an environment) and it would have been obvious to one of ordinary skill in the art to optimize the amount of water to obtain the desired cubic complex as disclosed in Reichmann et al. Alternatively, the water in Reichmann would inherently provide an gaseous atmosphere that contains moisture as required in the instant claims. Again, it would have been obvious to one of ordinary skill in the art to optimize the amount of water to provide sufficient moisture in order to form the desired cubic complex in the process of Reichmann. It would also have been obvious to one skilled in the art to provide the required water or moisture by any known means as long as such water or moisture is available for converting the titanium-containing starting material in Reichmann to the octomeric titanium compound.

Art Unit: 1793

Optionally, in the event that the TiOCl_2 is not inherently formed in Reichmann, Kim et al can be applied to teach that by using TiOCl_2 as the starting material to form TiO_2 , the process can be carried out at lower temperature (note "Results and Discussion" on page 928, paragraph bridging the two columns and paragraph bridging pages 928-929).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use TiOCl_2 as the starting material in the process of Reichmann et al, as suggested by Kim et al, because by using TiOCl_2 , first to form the octomeric complex, then to convert such complex to TiO_2 , the last step can be carried out at lower temperature to save energy.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone

Art Unit: 1793

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ngoc-Yen M. Nguyen/
Primary Examiner, Art Unit 1793

nmn
January 27, 2010